

REMARKS

The Examiner's non-final Office Action of December 15, 2003 has been received and its contents reviewed. By the above actions, independent claims 23, 28, 34 and 39 have been amended in a non-narrowing manner to clarify the step of "forming an impurity region to which an ion of a noble gas element accelerated by an electric field is added in the crystalline semiconductor film through the opening" as is disclosed at least at Figure 1b and page 12, lines 18-34. Accordingly, claims 1-65 remain pending for consideration, of which claims 1, 6, 12, 17, 23, 28, 34, 39, 45, 50, 55 and 60 are independent. In view of these actions and the following remarks, reconsideration of this application is now requested.

With regard to the Examiner's rejection of claims 1-65, under 35 U.S.C. §103(a), as being obvious in view of the combination of teachings of Makita et al. ('003) and Ueda et al. ('259), the Applicants respectfully traverse this rejection.

The teachings of Makita et al. do not include each of the claimed features as pointed out in the Amendment September 22, 2003. That is, Makita et al. contains no teaching, disclosure, or suggestion of the steps of forming an impurity region to which a noble gas element is added in the crystalline semiconductor film, and/or of segregating the metal element in the impurity region containing the noble gas element by a second heat treatment.

To remedy the shortcoming in Makita et al of failing to teach "the step of to [sic] which a noble gas element (accelerated by a electric field) is added", the Examiner relies upon the teachings of Ueda et al. However, a careful reading of Ueda et al. reveals that the patentees do not teach or even remotely suggest the features of the independent claims. For example, claim 1 sets forth the following steps:

A method of manufacturing a semiconductor device comprising the steps of:

...forming an impurity region to which a noble gas element is added in the crystalline semiconductor film; and

segregating the metal element in the impurity region containing the noble gas element by a second heat treatment. (Emphasis added)

In contrast to the claimed process above, Ueda et al. teach a method of gettering a crystallization acceleration metal, such as nickel, contained in a semiconductor layer by a (second or third) heating process, e.g., in the range of 700 °C to 1150 °C, in an environment containing inert gas, e.g., nitrogen, hydrogen, argon, helium, etc., or a non-oxidative environment of a halogen containing gas (see column 11, line 54, to column 12, line 64). During this heating the acceleration crystallization metal moves out of a region of the semiconductor and/or into an overlying/adjacent oxide layer (see Figure 1f; column 13, line 61, to column 14, line 3). This process does not involve any discussion or implication of the claimed process in which 1) the noble element ions are first implanted into a region of the semiconductor (by an accelerated electric field), and then 2) gettering of the crystallization acceleration metal in those regions containing the noble element by a second heat treatment. Neither Ueda et al, explicitly or implicitly, teaches the first noble element forming regions, and the Examiner has provided absolutely no discussion or motivation which would suggest to one ordinary skill in the prior art that such a step of noble element implantation occurs in Ueda et al and would be obvious for use in the process of Makita et al. Particular note is made of the fact that the gettering heating steps of Ueda et al. are not stated to contain any process step which would accelerate ions of the inert gas to cause implantation of the noble element ions into the semiconductor film.

Consequently, since each and every feature of the present claims is not taught (and is not inherent) in the teachings of Makita et al. or Ueda et al. and since neither Ueda et al. or the Examiner has provided any (explicit or implicit) suggestion or motivation which would cause one of ordinary skill in the prior art to modify the teachings of Makita et al. to form a noble element implanted region in the semiconductor film prior to gettering the acceleration material, as is required by


MPEP Chapter 2143 in order to establish a *prima facie* case of obviousness, the rejection of claims 1-65, under 35 U.S.C. §103(a), as being obvious in view of the combined teachings of Makita et al. and Ueda et al. is improper and must now be withdrawn.

In view of the amendments and arguments set forth above, the Applicants respectfully requests reconsideration and withdrawal of the pending §103(a) rejection.

While the present application is now believed to be in condition for allowance, should the Examiner find some issue to remain unresolved, or should any new issues arise, which could be eliminated through discussions with Applicants' representative, then the Examiner is invited to contact the undersigned by telephone in order that the further prosecution of this application can thereby be expedited.

Lastly, it is noted that a separate Extension of Time Petition (one month) accompanies this response along with an authorization to charge the requisite extension of time fee to Deposit Account No. 19-2380 (740756-2410). However, should that petition become separated from this Amendment, then this Amendment should be construed as containing such a petition. Likewise, any overage or shortage in the required payment should be applied to Deposit Account No. 19-2380 (740756-2410).

Respectfully submitted,



Jeffrey L. Costellia
Registration No. 35,483

NIXON PEABODY LLP
Suite 900, 401 9th Street, N.W.
Washington, D.C. 20004-2128
(202) 585-8000